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- (71) Applicant: **MOTOROLA, INC.** [US/US]; 1303 East Algonquin Road, Schaumburg, IL 60196 (US).
- (72) Inventors: **LIU, Kungwei, Mike**; 1244 N. Hazelton Dr., Chandler, AZ 85226 (US). **WANG, Tair-Hung**; 726 W. Monte Circle, Mesa, AZ 85210 (US). **LEDUC, Sheryl, L.**; 11126 E. Breathless Dr., Gold Canyon, AZ 85219 (US). **BHASKARAN, Parvathy**; 1808 S. Standage Circle, Mesa, AZ 85202 (US).
- (74) Agent: **WUAMETT, Jennifer B.**; Motorola, Inc., Intellectual Property Department, AZ 11/56-238, 3102 North 56th Street, Phoenix, AZ 85018 (US).
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(54) Title: METHOD AND SYSTEM OF MANAGING PROFILES

(57) Abstract:

METHOD AND SYSTEM OF MANAGING PROFILES

Field of the Invention

5 This invention relates generally to an information appliance system and, in particular to profiles within an information appliance system.

Background of the Invention

10 Profiles are currently used in many computer and wireless information networks to store characteristics of particular devices, applications and users. Presently, profiles are managed and stored as flat parameter lists. These are simple lists that contain the characteristics of devices, applications and users. Lists are generally tied to a specific device or application within a network or
15 system and are not expandable or flexible for particular groups of similar devices or applications. This complicates the management of user preference information since user preference data cannot be managed separately from device and application attribute data. Since device and application attribute data can contain proprietary information, user preference data cannot readily
20 be shared between groups of similar devices and applications or manipulated outside the realm of a particular device or application.

 Accordingly, there is a significant need for a profile management system that overcomes the deficiencies in the prior art outlined above.

Brief Description of the Drawings

Referring to the drawing:

5 FIG.1 depicts an exemplary information appliance system;

FIG.2 depicts a user node communication device of an exemplary information appliance system;

FIG.3 depicts a local node of an exemplary information appliance system;

10 FIG.4 depicts a regional node of an exemplary information appliance system;

FIG.5 depicts a block diagram of a profile management portion of information appliance system;

FIG.6 depicts a block diagram of a profile management API;

15 FIG.7 depicts a detailed block diagram of a profile service;

FIG.8 depicts an entity relationship diagram of an exemplary embodiment of a server profile data store; and

FIG.9 depicts an example of an implementation of the attribute and preference lists in FIG.8 in building a multi-level hierarchy.

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It will be appreciated that for simplicity and clarity of illustration, elements shown in the drawing have not necessarily been drawn to scale. For example, the dimensions of some of the elements are exaggerated relative to each other. Further, where considered appropriate, reference numerals have
25 been repeated among the Figures to indicate corresponding elements.

Description of the Preferred Embodiments

An embodiment of the invention is for a method and system for
5 managing profiles in an information appliance system. The method includes
providing a plurality of attributes of the information appliance system and
creating a plurality of user preferences for each of a plurality of users of the
system. User preferences are maintained separately from the plurality of
attributes within the information appliance system.

10 A system which implements this method is an embodiment of the
invention and includes user node communication devices having a plurality of
device attributes and applications having a plurality of application attributes,
where users, through use of the user node communication devices, can
access applications. A data store stores device attributes, application
15 attributes and user preferences, and maintains user preferences separately
from device and application attributes in the information appliance system.

The method and system described above have numerous advantages
including an extensible and flexible profile management system that is more
user friendly and convenient across separate devices and applications.
20 Another advantage of the invention is the separation of user preferences from
device and application attributes. This allows user preference information to
be portable across devices and applications in addition to freeing up user
preference data for subsequent value added processing. Still another
advantage is the ability to apply profiles to groups of similar devices and

applications to retain the "look and feel" of an application and the run-time behavior of a device and application.

A profile can include, without limitation, attributes, characteristics, parameters, and the like, pertaining to a device, application, service or user.

- 5 Profiles can include attributes of devices, applications and services. Profiles can also include user preferences. In addition, profiles can be specific to a category of devices, applications, services or users.

- A user of the information appliance system can be defined as a person or group of persons who have limited access to the information appliance system. Limited access means that users can only create, delete and edit certain types of data, for example, user preferences, and the like. A provider in the context of the information appliance system can be defined as one of a class of entities that can administer devices and applications within the information appliance system. For example, a provider can be an automotive manufacturer, car rental agency, original equipment manufacturer (OEM), after market OEM, and the like. Providers, for example, can have administrative access to the information appliance system that allows them to add and delete users, add, delete and edit both devices and applications and provide services for the information appliance system. Also, providers can add, delete and edit device and application attributes. Providers can also function as system administrators, for example, managing services utilized by users and data associated with the information appliance system. Examples of device and application attributes will be discussed below.
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- FIG.1 depicts an exemplary information appliance system 100. Shown in FIG.1 are examples of components of an information appliance system 100,
- 25

which comprises a plurality of servers 102 connected to a regional node 104 and a plurality of local nodes 106 connected to regional node 104. There can be any number of servers 102, regional nodes 104 and local nodes 106 within the information appliance system 100. The regional node 104 can be
5 connected to a network such as the Internet 114 and any number of concierge services 112.

Without limitation, local node 106 can be a kiosk, cell site, local area network (LAN), telephone company, cable company, satellite, or any other information service, structure or entity that can transmit, receive and or
10 communicate information. An information service can be any desired service including but not limited to telecommunications, broadband communications, entertainment, television, radio, recorded music, movies, computer-based games, Internet, and other types of public, private, personal, commercial, government, and military communications.

15 Local node 106 is connected to any number of user nodes 108 via wireline or wireless interface means. In the embodiment depicted in FIG.1, user node 108 includes a user node communication device 109 (shown in FIG.2) that is disposed to transmit and receive information using wireless communication means. User node 108 without limitation can include a car,
20 truck, bus, aircraft, boat, cellular handset, personal digital assistant (PDA), hand-held portable device, computer, and the like. Without limitation, user node communication device 109 can be an integral part of user node 108, mounted in a vehicle or other mobile device, carried by the user of the information appliance system 100, and the like. User node 108 can include
25 more than one user node communication device 109.

User node 108, via user node communication device 109 can also transmit and receive data from devices and services other than local node 106. For example, user node communication device 109 can transmit and receive data from a satellite 110, other user nodes 108, other user node communication devices 109, and the like.

The information appliance system 100 including the user node 108 and user node communication device 109 are capable of utilizing audio data in any number of encoding methods from any number of sources that include but are not limited to ADPCM, CD-DA, ITU G.711, G.722, G.723 & G.728, MPEG I, II & III, AC-3, AIFF, AIFC, AU, Pure Voice, Real Audio and WAV.

The information appliance system 100 including the user node 108 and user node communication device 109 are capable of utilizing video data in any number of encoding methods from any number of sources that include but are not limited to ITU H.261 & H.263, Motion JPEG, MPEG-1, MPEG-2 and MPEG-4, Cinepak, ClearVideo, Sony DV, Indeo, Real Video, Sorensen and VDOLive.

Additionally, the information appliance system 100 is capable of utilizing audio and video data in any number of formats from any number of sources that include but are not limited to USB, IEEE 1394-1995 and IEEE 802.x, and using protocols such as HTTP, TCP/IP, and UDP/IP.

FIG.2 depicts a user node communication device 109 of an exemplary user node 108 of an exemplary information appliance system 100. User node communication device 109 can without limitation be located within user node 108, be an integral part of the user node, and the like. For example, user node communication device 109 can be mounted in a vehicle such as an

automobile, boat or aircraft, carried with a user, located in a stationary location, and the like. As shown in FIG.2, the user node communication device 109 comprises a processor 120 with associated user node control algorithms 126 and user node memory 128. User node memory 128 can include but is not
5 limited to random access memory (RAM), read only memory (ROM) and other memory such as a hard disk, floppy disk, and or other appropriate type of memory. Processor 120 and user node control algorithms 126 can initiate and perform communication with other nodes shown in FIG.1 in accordance with suitable programs stored in user node memory 128.

10 User node communication device 109 also comprises a user interface device 130 that can include without limitation a tactile interface 134, microphone 133, speakers 132, any number of displays 131, and the like.

User node communication device 109 also comprises a transmitter/receiver 122 for transmitting and receiving communications via a
15 wireless signal 144 among the various nodes depicted in FIG.1.

Transmitter/receiver 122 also facilitates communication between other devices via wireless signal 159, for example, satellite 110, and the like.

Communications are transmitted and received through one or more antenna 142, which can include any one or combination of a fixed, steerable, omni-
20 directional, or phased array antenna. Steerable antenna can include, but is not limited to, an electronically steerable antenna, physically steerable antenna, and the like. User node communication device 109 can also include positioning devices 124, for example, global positioning system (GPS), gyroscope, compass, accelerometer, altimeter, rate sensors, and other
25 positioning devices 124 that can define the position of the user node 108.

User node communication device 109 can also comprise an intra-vehicle interface 136, which includes antenna 160. Intra-vehicle interface 136 is capable of short-range wireless communication, via wireless signal 161, with other wireless devices 138 and sensors 140, for example, cellular handsets, computers, pagers, PDA's, Games, printers, fax machines, TV, Bluetooth,
5 vehicle status sensors, and the like. Wireless device 138 can have antenna 162 and communicate via wireless signal 163. Sensor 140 can have antenna 164 and communicate via wireless signal 165.

In an embodiment, the various components and systems in FIG.2 can
10 communicate with each other via a wireline link 135, for example, a power/data/control bus, and the like. In another embodiment, the various components and systems in FIG.2 can communicate via a wireless link.

FIG.3 depicts a local node 106 of an exemplary information appliance system 100. As shown in FIG.3, the local node 106 comprises a processor 121
15 with associated local node control algorithms 146 and local node memory 148. Local node memory 148 can include but is not limited to random access memory (RAM), read only memory (ROM) and other memory such as a hard disk, floppy disk, and or other appropriate type of memory. Processor 121 and local node control algorithms 146 can initiate and perform communication with
20 other nodes shown in FIG.1 in accordance with suitable programs stored in local node memory 148.

Local node 106 also comprises any number of transmitters/receivers 175 for transmitting and receiving communications via wireless signal 144 from any number of user nodes 108. Communications are transmitted and received
25 through antenna 166.

Local node 106 also comprises any number of transmitter/receivers 176 for transmitting and receiving communications via wireless signal 168 from any number of regional nodes 104. Communications are transmitted and received through antenna 167. As shown in FIG.3, the various components and
5 systems can also communicate via terrestrial links, wireline links, and the like, with other local nodes 106 and regional nodes 104.

In an embodiment, the various components and systems in FIG.3 can communicate with each other via a wireline link 135, for example, a power/data/control bus, and the like. In another embodiment, the various
10 components and systems in FIG.3 can communicate via a wireless link.

FIG.4 depicts a regional node 104 of an exemplary information appliance system 100. As shown in FIG.4, the regional node 104 comprises a processor 123 with associated regional node control algorithms 150 and regional node memory 152. Regional node memory 152 can include but is not
15 limited to random access memory (RAM), read only memory (ROM) and other memory such as a hard disk, floppy disk, and or other appropriate type of memory. Processor 123 and regional node control algorithms 150 can initiate and perform communication with other nodes shown in FIG.1 in accordance with suitable programs stored in regional node memory 152.

20 Regional node 104 also comprises any number of transmitters/receivers 177 for transmitting and receiving communications via wireless signal 171 from any number of local nodes 106. Communications are transmitted and received through an antenna 170.

Regional node 104 also comprises any number of transmitters/receivers
25 178 for transmitting and receiving communications via wireless signal 168 from

any number of regional nodes 104, servers 102, and the like. Communications are transmitted and received through antenna 169. As shown in FIG.4, the various components and systems can also communicate via terrestrial links, wireline links, and the like, with other local nodes 106 and regional nodes 104.

5 In an embodiment, the various components and systems in FIG.4 can communicate with each other via a wireline link 135, for example, a power/data/control bus, and the like. In another embodiment, the various components and systems in FIG.4 can communicate via a wireless link.

FIG.5 depicts a block diagram of profile management portion 200 of
10 information appliance system 100. Profile management portion 200 without limitation, functions to manage and control a user's access and preference data within information appliance system 100. As shown in FIG.5, profile management portion 200 comprises a user side 202 and a server side 204. Without limitation, server side 204 can be located within any of servers 102
15 depicted in FIG.1. Also without limitation, user side 202 can be located within user node communication device 109, user node 108, and the like. In user side 202 and server side 204, user side profile service 210 and server side profile service 240 comprise a distributed service that together enable profile information that is stored in server side 204 to be transmitted to the user side
20 202 and vice-versa. User side profile service 210 and server side profile service 240 are connected and communicate via communications connection 206, which can comprise without limitation, any wireline or wireless connection that can use formats from any number of sources that include but are not
25 HTTP, TCP/IP, and UDP/IP.

User side 202 also comprises profile data store (PDS) 220, which is a persistent store of related profile information of user node communication device 109. PDS 220 is connected to profile service 210 and functions as a cache by maintaining persistent profile data despite availability of
5 communications connection 206 between user side 202 and server side 204.

User side 202 also comprises profile editor 212 connected to profile service 210, which is a user interface application that allows the user of user node communication device 109 to edit, add and delete certain profile data.

User side 202 also comprises selector application 214 connected to
10 profile service 210, which is used to start any of user-selected applications 216. Applications 216 for an information appliance system 100 can be without limitation, stock reporting applications, weather applications, road condition applications, local services (i.e. advertisements for restaurants, gas stations, entertainment), and the like. Application manager 218, which is connected to
15 profile service 210, performs resource allocation for applications 216 by requiring each of applications 216 to register with application manager and request required resources to operate each of applications 216.

Server side 204 comprises server profile data store (SPDS) 252 connected to profile access module 242, which is a storage apparatus for
20 device attributes such as user node communication device 109 attributes, application attributes and user preferences to be discussed below. SPDS 252 can be any type of data storage apparatus or system. For example and without limitation, SPDS 252 can be a distributed database where data is stored in any number of servers 102 within the information appliance system
25 100.

Server side 204 also comprises profile access module (PAM) 242, which is a centralized access point to SPDS 252. PAM 242 is connected to profile service 240 and profile management API 244 (application programming interface). PAM 242 enables access to any type of data store.

5 Server side 204 also comprises profile management API 244, which is connected to and used by profile editor 246, provisioning application manager 248 and web applications 250 in order to manipulate the data in SPDS 252. Profile editor 246 comprises an application available to users on the Internet, which allows a user to remotely login and create, delete and edit user
10 preferences on the information appliance system 100. In other words, profile editor 246 provides an application for users of the information appliance system 100 to access profiles by using means other than user node communication device 109. Provisioning application manager 248 comprises a system for a system administrator to operate, maintain and administrate the
15 server 102. Web applications 250 comprise one or more applications 216 on the user side 202 that would be accessed by a user utilizing for example, a personal computer, PDA, cellular handset, Internet, and the like.

FIG.6 depicts a block diagram of profile management API 244. As shown in FIG.6, profile management API 244 comprises login API 260 and
20 management API 262. Login API 260 is a module that assists web client 264 to authenticate a user. Without limitation, management API 262 is an application interface to web client 264, other clients, services, and the like. In the embodiment shown, management API 262 enables web client 264 to communicate with profile access module 242 to manipulate data stored in
25 SPDS 252. Login API 260 also communicates with directory service 266 to

authenticate a user. Login API 260 also communicates with session manager 268 to initiate a session. A session is an instance where a user logs onto the information appliance system 100 to create, delete or edit profile information. Management API 262 communicates with session manager 268 to obtain
5 session information and to validate a session.

Session manager 268 functions to initiate a session and returns a unique session I.D. to login API 260. Web client 264 uses session I.D. to perform editing functions to SPDS 252. Directory service 266 is connected to a user lightweight director access protocol (LDAP) data store 270, which
10 functions to store user account information for example, username, password, and the like. LDAP data store 270 enables fast lightweight, wireline or wireless read-only access to user account information where latency is kept to a minimum and large numbers of requests to data are necessary. Use of LDAP is known to one of ordinary skill in the art. Session data store 272 functions to
15 store session information associated with the login of users.

The operation of profile management API will now be described with reference to FIG.6. Login information 300, for example, user I.D., password, and the like, is sent from web client 264 to login API 260 when a user logs onto information appliance system 100.

20 Login API 260 transmits authentication request 302 to directory service 266, which can verify login information 300 by communicating with user LDAP data store 270, or any other similar data store apparatus or system. Authentication verification 304 is transmitted to login API 260, which then transmits session request 306 to session manager 268.

Thereafter, session manager 268 transmits a unique session I.D. 308 to login API 260. Session I.D. confirmation 310 is transmitted to web client 264 and used to allow a user to create, delete and edit profile data in SPDS 252.

A user, via web client 264, sends profile editing information 312 to management API 262. Thereafter, management API 262 requests session I.D. confirmation 314 to session manager 268. Once session manager 268 confirms session is still valid, session manager 268 then transmits session information 316 to management API 262. Session information 316 is utilized by both management API 262 and profile access module 242 to determine a user's level of access to SPDS 252. Thereafter, management API 262 transmits SPDS editing function 318 to profile access module 242 to perform actual SPDS 252 editing requested by web client 264.

FIG.7 depicts a detailed block diagram of user side profile service 210 and server side profile service 240. User side profile service 210 comprises profile service interface 274 and profile service implementation 276. Profile service interface 274 is the interface provided to all "actors" of the profile service, where "actors" can be defined to mean any person, process or function that interacts with the information appliance system 100. Profile service implementation 276 provides the "functionality" of user side profile service 210, such as calculations, formulas, logic functions, and the like.

Server side profile service 240 comprises server profile service 278 and server profile helper 280. Server profile service 278 is an object that receives a request from user side 202. Once server profile service 278 receives a request, it creates server profile helper 280, which is a process thread. This is done to avoid tying up the server profile service 278, which otherwise would

not be able to receive a request. Server profile service 278 can spin off multiple server profile helpers 280 to parallel process multiple requests. Server profile helper 280 communicates with profile access module 242 via remote method invocation (RMI) and receives profile data from SPDS 252 via
5 profile access module 242. Server profile helper 280 communicates profile data to user side 202 via communications connection 206.

FIG.8 depicts an entity relationship diagram of an exemplary embodiment of a server profile data store 252. In other words, FIG.8 represents a data model showing the relationship between various data entries
10 in SPDS 252. In the embodiment shown in FIG.8, SPDS 252 is a relational database. However, it is desired to be understood that the invention is not limited to a relational database and can include any apparatus, device, system, means, and the like, for storing, retrieving, editing and cross-referencing data. In the embodiment depicted in FIG.8, SPDS 252 comprises a plurality of tables
15 in a relational database that includes but is not limited to, device attributes, application attributes and user preferences.

Device attributes refer to user node communication device 109 attributes and can include, without limitation, device I.D. number, type and model of device, features of device, and the like. Application attributes refer to
20 attributes of any of applications 216 that are set by a provider. Application attributes can include, without limitation, application I.D. number, application name, type of application (i.e. stock reporting type, weather type, and the like.), features of an application (i.e. functions the application is capable of performing, and the like).

User preferences refer to parameters that are configurable by a user. Common user preferences are those that are common to all devices and applications including, without limitation, volume, background color, and the like. User preferences can also be device specific, application specific or both.

- 5 These can include, without limitation, organization of user information on a particular model of device, displaying or auto-launching frequently used features of a particular application, and the like. Also, user preferences can be device type and application type specific.

The relationship, or cardinality, between categories in each of the tables
10 shown in FIG.8 is illustrated by connecting lines. A "1" at the end of a connecting line denotes that there is only one element in that record in relation to the record at the other end of the connecting line. An "M" at the end of a connecting line denotes that there are multiple records in relation to the record at the other end of the connecting line. For example, the category I.D. in user
15 node table 404 has a one-to-many relationship with the category user node I.D. in user node communication device table 408. This indicates that for a single given user node, there can be many user node I.D.'s. In other words, a given user node 108 can have many user node communication devices 109 associated with it.

20 The data model of FIG.8 comprises a portion 400 that contains data entries that are controlled by providers and a portion 402 that contains data entries that are controlled by users. For example, portion 400 comprises device and application attributes, while portion 402 comprises user preferences. In an embodiment of the invention, portion 400 is maintained by
25 providers and portion 402 is maintained, for example, by a third party, which

could be an independent servicing entity, a third party provider, and the like. In an embodiment of the invention, portion 400 is maintained and managed separately from portion 402. For example, portion 400 is maintained and managed by providers, while portion 402 is maintained and managed by users.

5 In another embodiment, portion 400 is stored and maintained separately from portion 402 within the information appliance system 100.

Storing and maintaining portion 400 and 402 separately from each other has numerous advantages. For example, user preference information can be portable across user nodes 108, user node communication devices 109 and
10 applications 216. Since a portion of user preference data is not dependent upon the configuration of any particular device or application, it can be used for different groups of devices and applications. Another advantage of separating device and application attributes from user preferences is that user preference data is then free for subsequent value added processing. In this manner, user
15 preference data can be used, for example, by third parties for target marketing a certain user based on the user's preferences without the possibility of disclosing proprietary information contained in device and application attributes to third parties.

The various tables of an embodiment of the invention will now be
20 described with reference to FIG.8. However, it is desired to be understood that tables and data entries of FIG.8 are not limiting. The invention can comprise any number and type of tables and data.

Portion 400 comprises user node table 404 where each user node 108 is represented by a unique record that comprises user node I.D., an attribute
25 list I.D. and other related fields. For example, where user node 108 is an

automobile, the related fields can include a model and type of vehicle, color, vehicle identification number, and the like.

Device table 406 comprises records that include a device I.D., device type I.D. and an attribute list I.D. User node communication device table 408 includes records that comprise an I.D., user node I.D., and device I.D. User node communication device table 408 serves to associate user node communication devices 109 to corresponding user nodes 108. One user node 108 can include more than one user node communication device 109.

Device type table 410 comprises records that include an I.D., device type and attribute list I.D. The device type is a logical name that is used across boundary 401. Each device type record represents a particular user node communication device 109 model, whereas each device record in device table 406 represents a unique user node communication device 109. User node communication devices 109 can be grouped into any number of device type categories. Device features table 412 comprises records that include an I.D. and a device type I.D. that contains a feature list of a particular user node communication device 109 model.

Application configuration table 414 comprises records that include an I.D., application name, and attribute list I.D. The application name is a logical name that is used across boundary 401. Each application configuration record represents a particular application that is installed for a particular user node communication device 109 model that it is associated with.

Application device configuration table 416 comprises records that include an I.D., application I.D., device type I.D. and attribute list I.D. Each

record of application device configuration table 416 contains device specific application configuration attributes.

Device type application table 418 comprises records that include an I.D., device type I.D, and application I.D. Each record of device type application
5 table 418 defines the set of applications for each type of user node communication device 109 model represented in device type table 410.

Device application table 420 comprises records that include an I.D., device I.D., and application I.D. Each record of device application table 420 defines the association between a user node communication device 109 in
10 device table 406 and application configuration in application configuration table 414.

Application type table 422 comprises records that include an I.D., application type name and attribute list I.D. The application type name is a logical name that is used across boundary 401. Each record of application
15 type table 422 represents groups of applications performing similar functions, for example, route guidance applications, stock reporting applications, and the like. Applications can be grouped into any number of application type categories.

Portion 402 comprises user table 430 where each record includes an
20 I.D. and an attribute list I.D. Each record of user table 430 contains a user's personal information, for example, address, phone number, account I.D., password, and the like.

User node user table 432 comprises records that include an I.D., user node I.D., and user I.D. Each record of user node user table 432 defines the
25 relationship between a user and a user node 108.

Common preferences table 434 comprise records that include an I.D., user I.D. and attribute list I.D. Each record of common preferences table 434 contains common user preferences for multiple applications and devices, for example, voice volume, background color, font size, and the like.

5 Common device preferences table 436 comprise records that include an I.D., user I.D., device type and attribute list I.D. Each record of common device preferences table 436 contains common user preferences that are device type specific, for example, button functionality for soft keys of a particular type of device, and the like. Device specific preferences are utilized
10 whenever one of the plurality of devices in the corresponding device type category from table 410 is utilized. A user who has more than one user node communication device 109 can have multiple records in 436.

Application preferences table 438 comprise records that include I.D., application name, user I.D. and attribute list I.D. Each record of application
15 preferences table 438 contains application specific preferences that supercede common preferences, should they collide. For example, background color for a particular application could override the common background color selected under common preferences table 434. Application specific preferences are utilized whenever one of the plurality of applications in the corresponding
20 application type category from table 422 is utilized. Each of a user's applications can contain a separate record within table 438.

Application device preferences table 440 comprise records that include an I.D., application name, user I.D., device type and attribute list I.D. Each record of application device preferences table 440 contains device specific and

application specific preferences that supercede common device preferences. In table 440, there is one record per application per device per user.

Application type preferences table 442 comprises records that include I.D., application type name, user I.D. and attribute list I.D. Each record of application type preferences table 442 stores user preferences that are common to a particular application type. Table 442 governs the "look and feel" that is common to a particular group of applications, for example, every stock reporting application will have the same background color, set of tickers, portfolio tracking, and the like. Table 442 also governs the run-time behavior of a particular group of applications. Table 442 is application type specific and user specific.

Application type device preferences table 444 comprises records that include an I.D., application type name, user I.D., device type and attribute list I.D. Each record of application type device preferences table 444 contains information similar to table 442, except that it is device type specific, application type specific and user specific.

In tables 434, 436, 438 and 440, a user creates and stores a plurality of records. A single user or group of users can specify preferences in more than one record. The plurality of user preferences in portion 402 can be created and edited separately from the plurality of device attributes and the plurality of application attributes in portion 400.

In an embodiment of the invention, a provider creates default device attributes for user node communication devices 109 and default application attributes for applications 216. The default device and application attributes can be a subset of the plurality of device and application attributes

respectively. Subsequently, a user creates device and application preferences, for example in tables 434, 436, 438 and 440, that supercede those created by the provider. In effect, the user creates user preferences that supercede the device and application specific default attributes. In another
5 embodiment, user preferences can supercede default device attributes or default application attributes or both. For example, a provider can create a default background color for a stock reporting application, which is a default application attribute. Subsequently, a user can create an application preference for stock reporting applications, setting the user's preferred
10 background color. Subsequently, whenever the user logs onto a stock reporting application, the background color selected by the user is utilized over the default background color created by the provider.

As shown in the above embodiment, logical names, as opposed to unique I.D.'s, are used to link the plurality of device attributes, the plurality of
15 application attributes and the plurality of user preferences across boundary 401. This enables the separation of user preferences from device and application attributes and offers the advantage of a more flexible and more efficient organization of data than prior art, flat parameter lists. This also enables the plurality of user preferences to be utilized by user node
20 communication devices 109 and applications 216.

In an embodiment of the invention, other services available to the user of the information appliance system 100 can be incorporated into the data store of attributes and preferences. Services can include, for example, types of services available to a particular vehicle within a given local area, types of
25 restaurants, gas stations, and the like. The service attributes and associated

user preferences can be modeled analogously to the attributes and preferences shown in FIG.8. It is desired to be understood, that the term "applications" refer to both services and applications in the context of the embodiments of the invention.

5 In the embodiment of the invention shown in FIG.8, assigning a hierarchical relationship to any of the plurality of attributes and plurality of user preferences can create a multi-level hierarchy. In other words, any device attributes, application attributes or user preferences, or any combination of attributes (device, application, service, and the like) and/or user preferences
10 can be assigned a hierarchical relationship to create a multi-level hierarchy. In, another embodiment, a multi-level hierarchy is formed by assigning a hierarchical relationship to the plurality of user preferences within each of the plurality of profiles. A profile that comprises user preferences for particular user or group of users can, without limitation, be defined as a user profile.

15 Linking the plurality of attributes and the plurality of user preferences ensures that the plurality of user preferences will interface with, and be capable of being utilized by, the plurality of device and application attributes. Utilizing the advantage of hierarchical profiles, users, providers and system administrators can easily manage profiles for a plurality of users.

20 FIG.9 depicts an example of an implementation of the attribute and preference lists in FIG.8 in building a multi-level hierarchy 500. In the embodiment shown in FIG.9, an example of a multi-level hierarchy 500 includes two primary categories branching from root 515: RADIO and STOCK. The RADIO category comprises two sub-categories: COUNTRY and ROCK,
25 referring to the categories of country music and rock music.

Table 501 comprises a plurality of rows, each of which contains an I.D. column 503, a "branch or not" column 505 and an item I.D. column 507. Table 502 comprises a plurality of rows, each of which contains an I.D. column 504, a "name" column 506 and a "value" column 508. Table 501 and table 502 can be, for example, any tables from FIG.8 that contain device attributes, application attributes or user preferences.

An example of assigning a hierarchical relationship to create the multi-level hierarchy 500 utilizing tables 501 and 502 will now be discussed. Table 501, row 1 contains an I.D. (e.g. 1) in I.D. column 503. Row 1 contains a "Y" in "branch or not" column 505 indicating that row 1 represents the root of the multi-level hierarchy 500, and it contains a "2" in item I.D. column 507 that points to each "2" in I.D. column 403. Table 501, row 2 contains a "2" in column 503 and an "N" in column 505, indicating that row 2 is an attribute with no branch, so the "1" in column 507 points to the "1" in column 504 of table 502. Row 1 of table 502 has "label" as an attribute name in column 506, and "RADIO" as an attribute value in column 508. Therefore, "RADIO" appears as one of the branches off the root 515 in multi-level hierarchy 500.

Table 501, row 3 contains a "2" in column 505, and a "Y" in column 505 and a "3" in column 507. The "Y" indicates a branch and the "3" points to the "children" in rows 520 and 521. Row 520 has an "N" in column 505 indicating no branch, and a "2" in column 507 that points to the second row of table 502, which has a "type" in the name column 506 and "COUNTRY" in value column 508. Therefore, "COUNTRY" is a child of the parent branch "RADIO."

Row 521 has an "N" in column 505 indicating no branch, and a "3" in column 507 that points to the third row of table 502, which has a "type" in the

name column 506 and "ROCK" in value column 508. Therefore, "ROCK" is another child of the parent branch "RADIO."

Row 522 has an "N" in column 505 indicating no branch, and a "4" in column 507 that points to the fourth row of table 502, which has a "label" in the name column 506 and "STOCK" in value column 508. Therefore, "STOCK" appears as one of the branches off the root 515 in multi-level hierarchy 500.

In effect, a user can log onto information appliance system 100 either directly or remotely and create, edit and delete a profile by selecting desired user preferences. In addition, user preferences can be linked with device and application attributes provided by a provider. Users can create any number of profiles, which are portable across any user node communication devices 109 and applications 216. The user can select any desired combination of applications 216 and categories of applications to suit his or her preferences and have them implemented in a multi-level hierarchy. This offers the advantage of a flexible profile management system that is extensible and portable across separate devices and applications. Another advantage is that profiles are applied to similar groups of devices and applications to retain the "look and feel" of an application and the run-time behavior of a device or application.

It is desired to be understood that multi-level hierarchy 500 and tables 501 and 502 are in no way limiting. Any combination of device attributes, application attributes and user preferences can be utilized to form a multi-level hierarchy and a resulting profile.

In summary, an embodiment of the invention is for a method and system of managing profiles in an information appliance system. The method

of the invention includes providing a plurality of attributes of the information appliance system and creating a plurality of user preferences for each of a plurality of users of the system. Profiles are stored in a data store of the information appliance system. User preferences are maintained separately
5 from the plurality of attributes within the information appliance system.

The system of the invention includes user node communication devices having a plurality of device attributes and applications having a plurality of application attributes, where users, through use of the user node communication devices, access the applications. A data store stores device
10 attributes, application attributes and user preferences, and maintains user preferences separately from device and application attributes in the information appliance system.

The method and system of the invention have numerous advantages including a profile management system that is not only extensible and flexible,
15 but is more user friendly and convenient across separate devices and applications. Another advantage of the invention is the separation of user preferences from device and application attributes. This allows user preference information to be portable across devices and applications in addition to freeing up user preference data for subsequent value added
20 processing. Still another advantage is the ability to apply profiles to groups of similar devices and applications to retain the "look and feel" of an application and the run-time behavior of a device and application.

While we have shown and described specific embodiments of the present invention, further modifications and improvements will occur to those

skilled in the art. For example, a variety of different services, devices and applications can be incorporated into the profile system.

We desire it to be understood, therefore, that this invention is not limited to the particular forms shown and we intend in the appended claims to cover
5 all modifications that do not depart from the spirit and scope of this invention.

CLAIMS

1. A method of managing a plurality of profiles in a component of an information appliance system comprising (100):

5 providing a plurality of user node communication devices (109) each having a plurality of device attributes (410, 412);

 providing a plurality of applications (216) each having a plurality of application attributes (438), wherein the plurality of applications are capable of being accessed by a plurality of users utilizing at least one of the plurality of
10 user node communication devices;

 creating for each of the plurality of users a plurality of user preferences;

 storing the plurality of device attributes and the plurality of application attributes and the plurality of user preferences in a data store (252, 270, 272) of the information appliance system; and

15 maintaining the plurality of user preferences separately from the plurality of device attributes and the plurality of application attributes within the information appliance system.

2. The method of claim 1, further comprising grouping a portion of the
20 plurality of user preferences into a common user preferences category (434), wherein the common user preferences category comprises each of the plurality of user preferences that are common to both the plurality of applications and the plurality of user node communication devices.

3. A method of managing a plurality of profiles in a component of an information appliance system (100) comprising:

providing a plurality of user node communication devices (109);

providing a plurality of applications (216) capable of being accessed by

5 at least one of the plurality of user node communication devices;

providing a plurality of attributes of the information appliance system;

creating a plurality of user preferences for each of a plurality of users of the information appliance system;

storing the plurality of user preferences separately from the plurality of

10 attributes within the information appliance system.

4. The method of claim 3, further comprising grouping a portion of the plurality of user preferences into a common user preferences category (434), wherein the common user preferences category comprises each of the plurality
15 of user preferences that are common to both the plurality of applications and the plurality of user node communication devices.

5. An information appliance system (100) comprising:

a plurality of user node communication devices (109);

20 a plurality of applications (216) capable of being accessed by at least one of the user node communication devices;

a plurality of attributes of the information appliance system;

a plurality of user preferences for each of a plurality of users of the information appliance system; and

a data store (252, 270, 272) for storing the plurality of attributes and the plurality of user preferences, wherein the plurality of user preferences are maintained separately from the plurality of attributes within the information appliance system.

5

6. The information appliance system of claim 5, further comprising a common user preferences category (434), wherein the common user preferences category comprises each of the plurality of user preferences that are common to both the plurality of applications and the plurality of user node
10 communication devices.

7. A method of managing a plurality of profiles in a component of an information appliance system comprising (100):

providing a plurality of user node communication devices (109) each
15 having a plurality of device attributes (410, 412);

providing a plurality of applications (216) each having a plurality of application attributes (438), wherein the plurality of applications are capable of being accessed by a plurality of users utilizing at least one of the plurality of user node communication devices;

20 creating a plurality of user preferences for each of the plurality of users;
storing the plurality of device attributes and the plurality of application attributes and the plurality of user preferences in a data store (252, 270, 272) of the information appliance system; and

forming a multi-level hierarchy by assigning a hierarchical relationship to any of the plurality of device attributes, the plurality of application attributes and the plurality of user preferences.

- 5 8. The method of claim 7, further comprising grouping a portion of the plurality of user preferences into a common user preferences category (434), wherein the common user preferences category comprises each of the plurality of user preferences that are common to both the plurality of applications and the plurality of user node communication devices.

10

9. A method of managing a plurality of profiles in a component of an information appliance system (100) comprising:

- creating a plurality of user preferences for a user of the information appliance system, wherein the plurality of user preferences define at least one
15 of the plurality of profiles;

 storing the plurality of profiles in a data store (252, 270, 272) of the information appliance system; and

 forming a multi-level hierarchy by assigning a hierarchical relationship to any of the plurality of user preferences within each of the plurality of profiles.

20

10. An information appliance system (100) comprising:

 a plurality of user node communication devices (109) each having a plurality of device attributes(410, 412);

- a plurality of applications (216) each having a plurality of application
25 attributes (414, 416, 418, 422), wherein the plurality of applications are

capable of being accessed by a plurality of users utilizing at least one of the plurality of user node communication devices;

a plurality of user preferences for each of the plurality of users;

a data store (252, 270, 272) for storing the plurality of device attributes

5 and the plurality of application attributes and the plurality of user preferences;

and

a hierarchical data structure including any of the plurality of device attributes, the plurality of application attributes and the plurality of user preferences.

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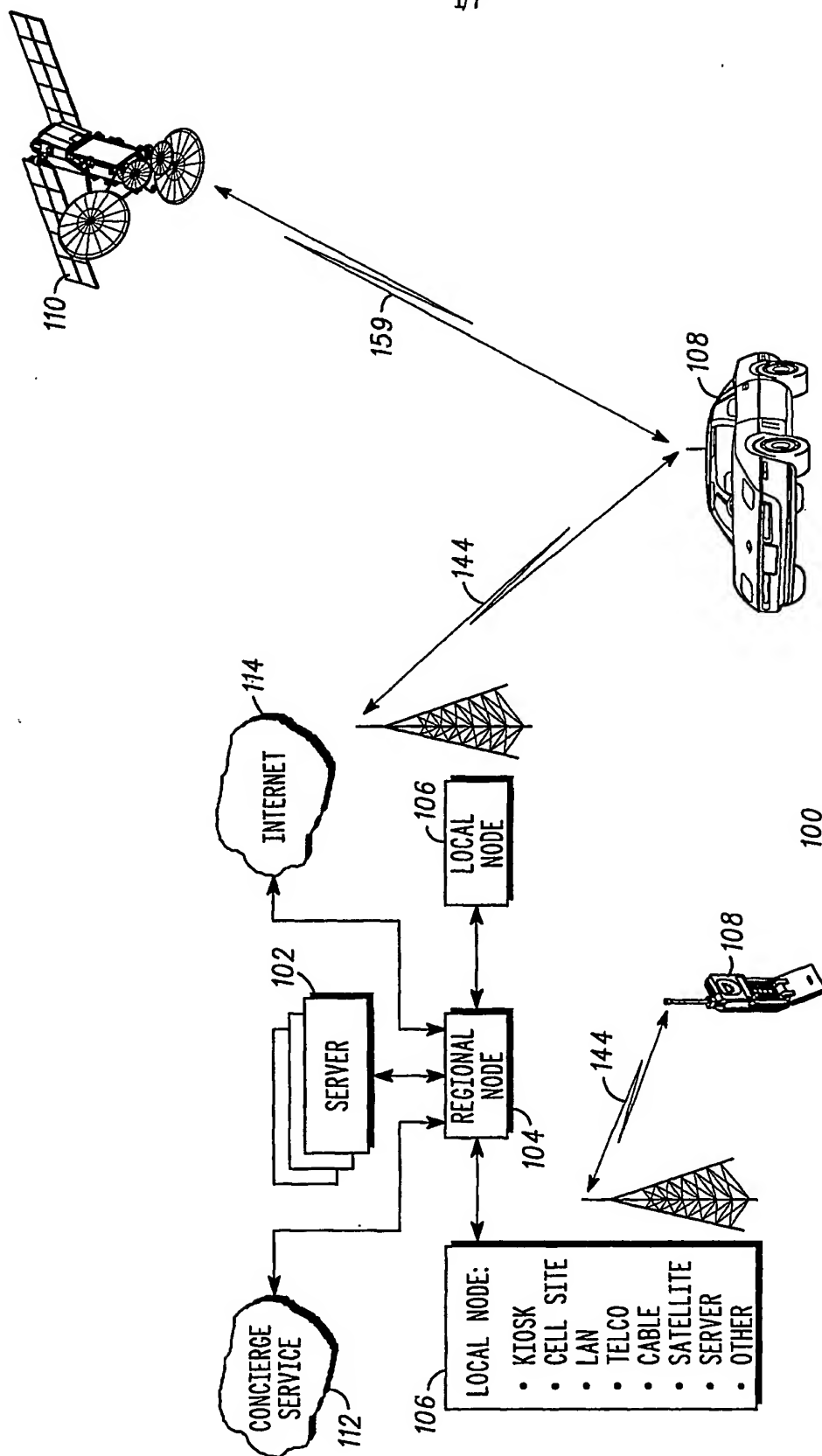


FIG. 1

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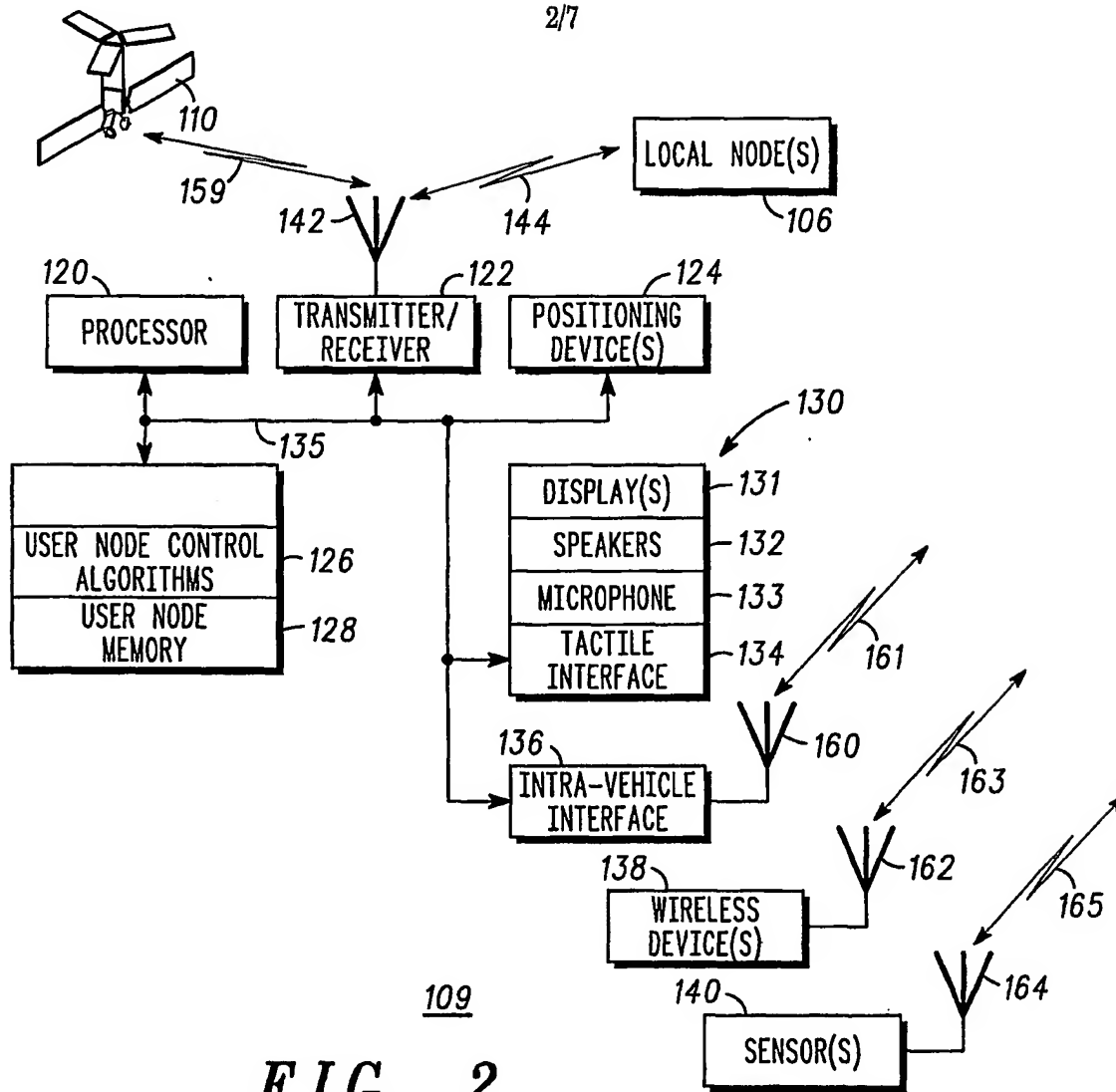


FIG. 2

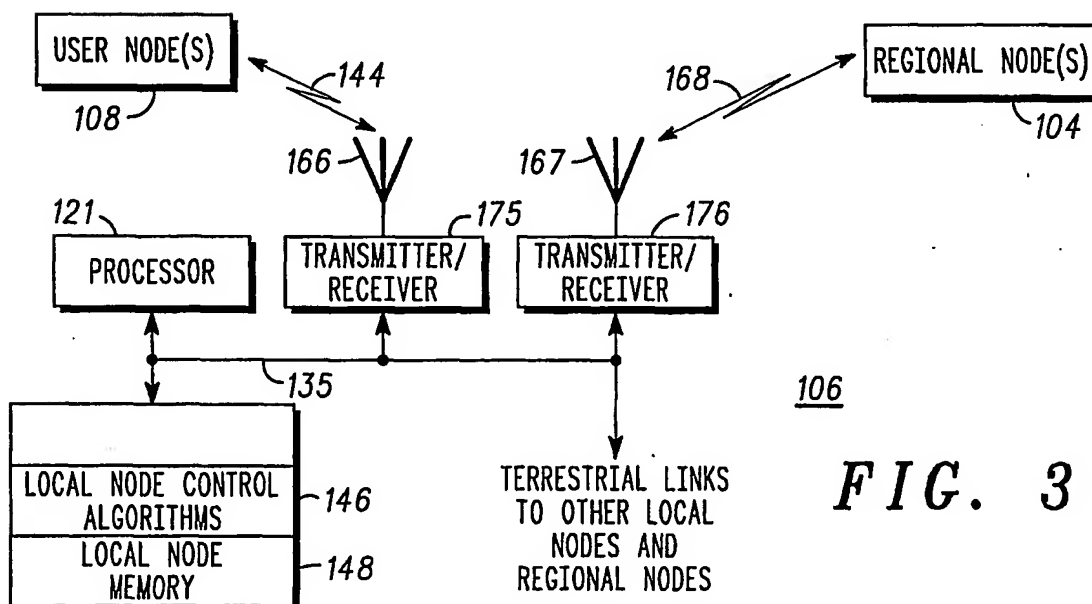
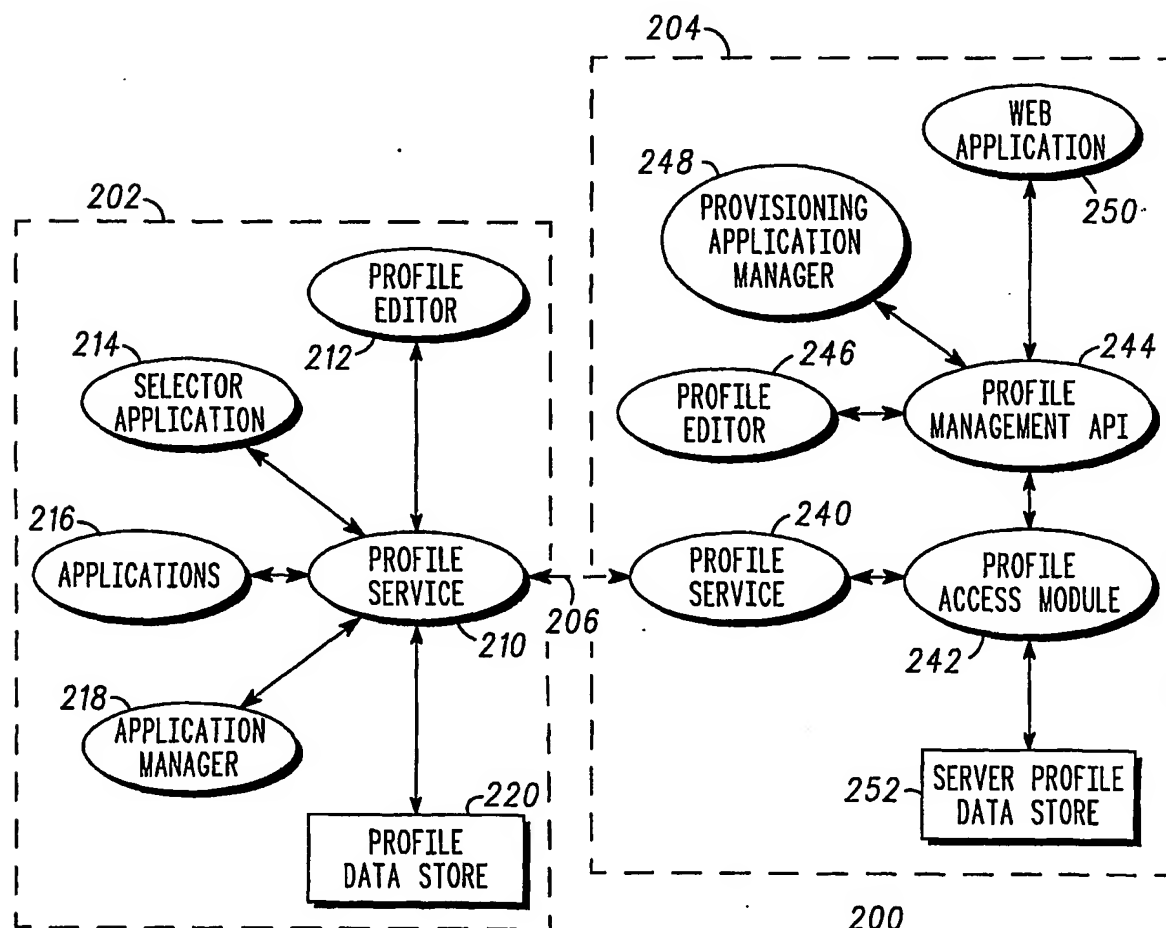
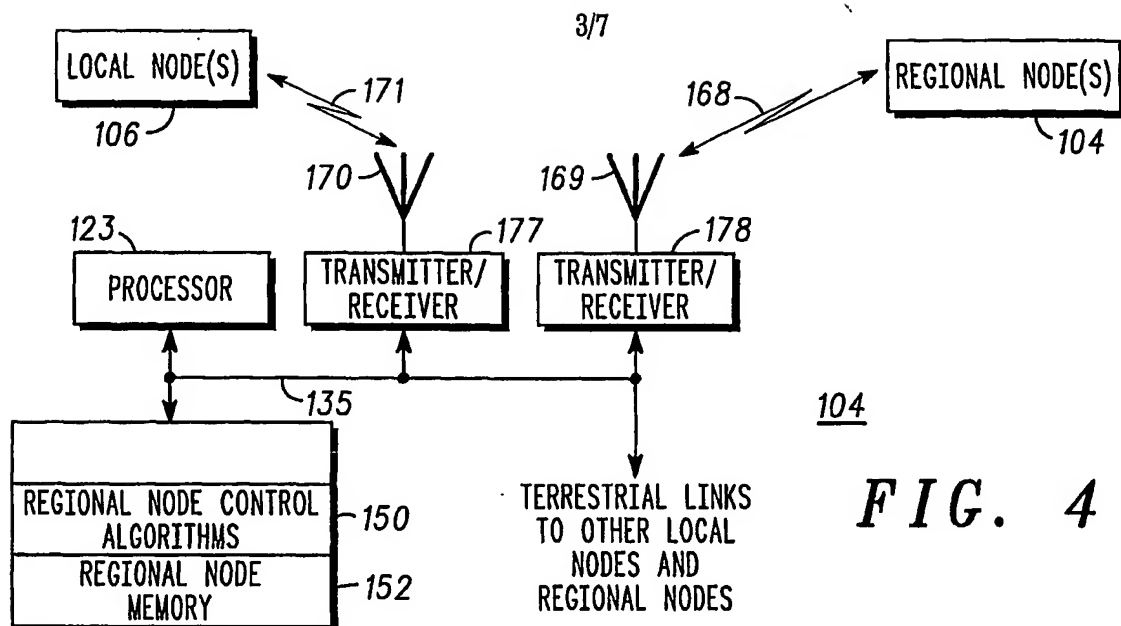
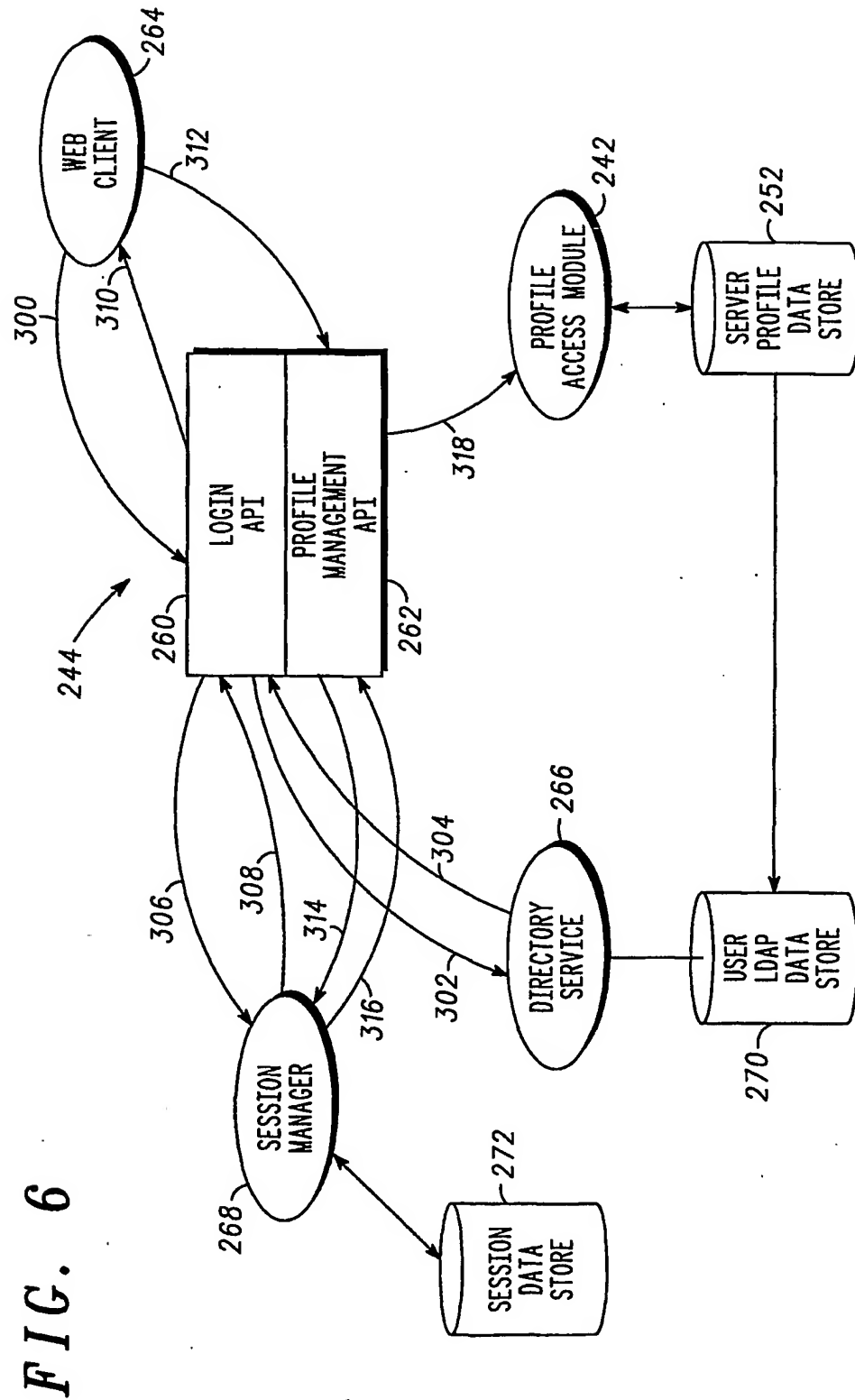
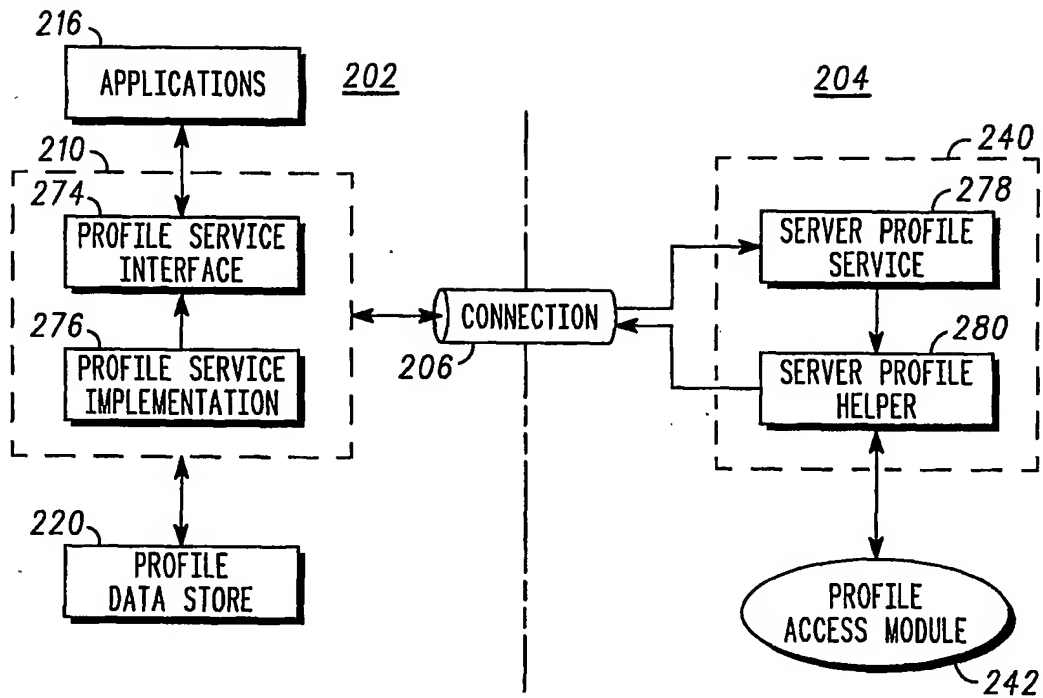


FIG. 3





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**FIG. 7**

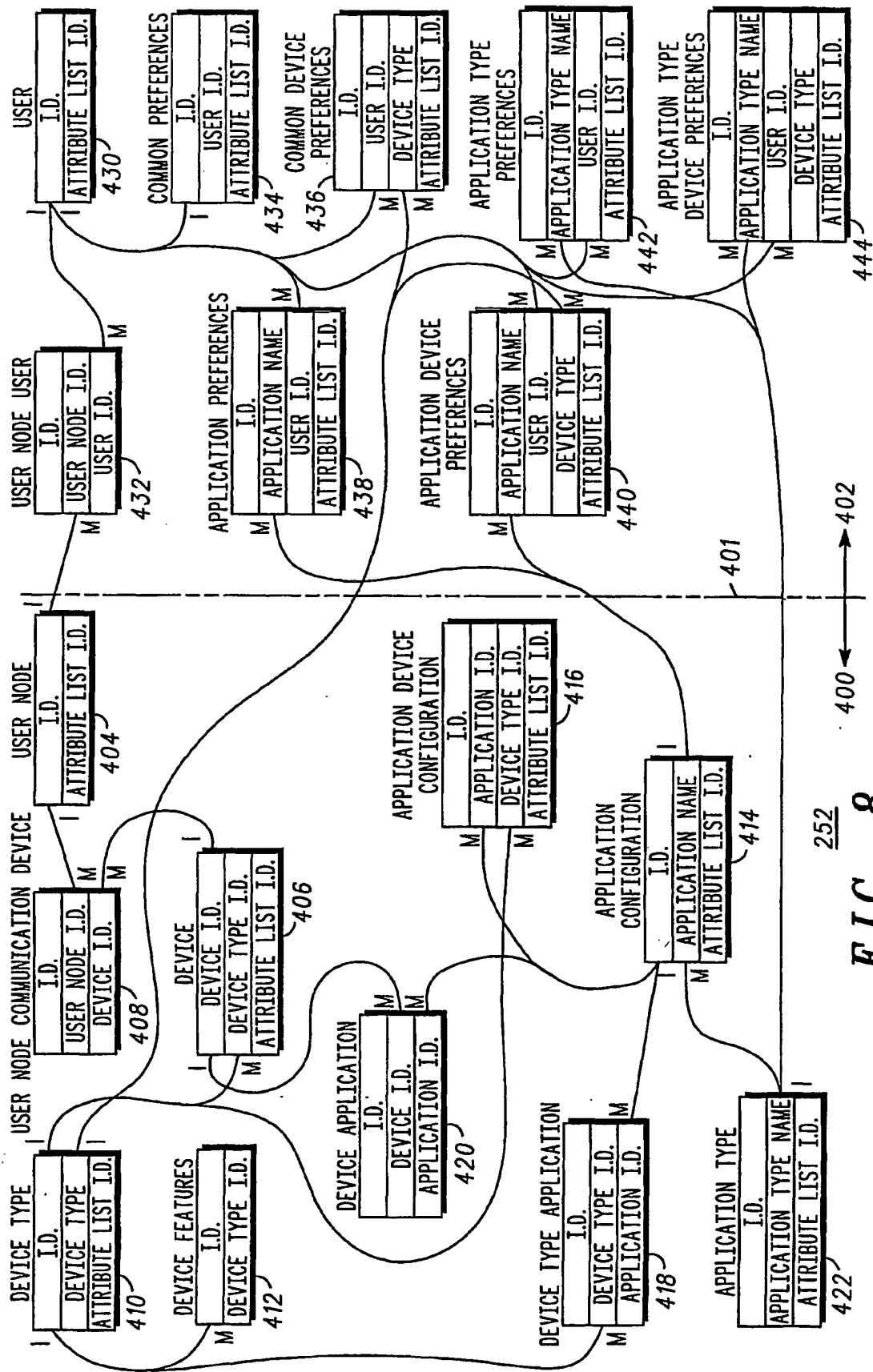


FIG. 8

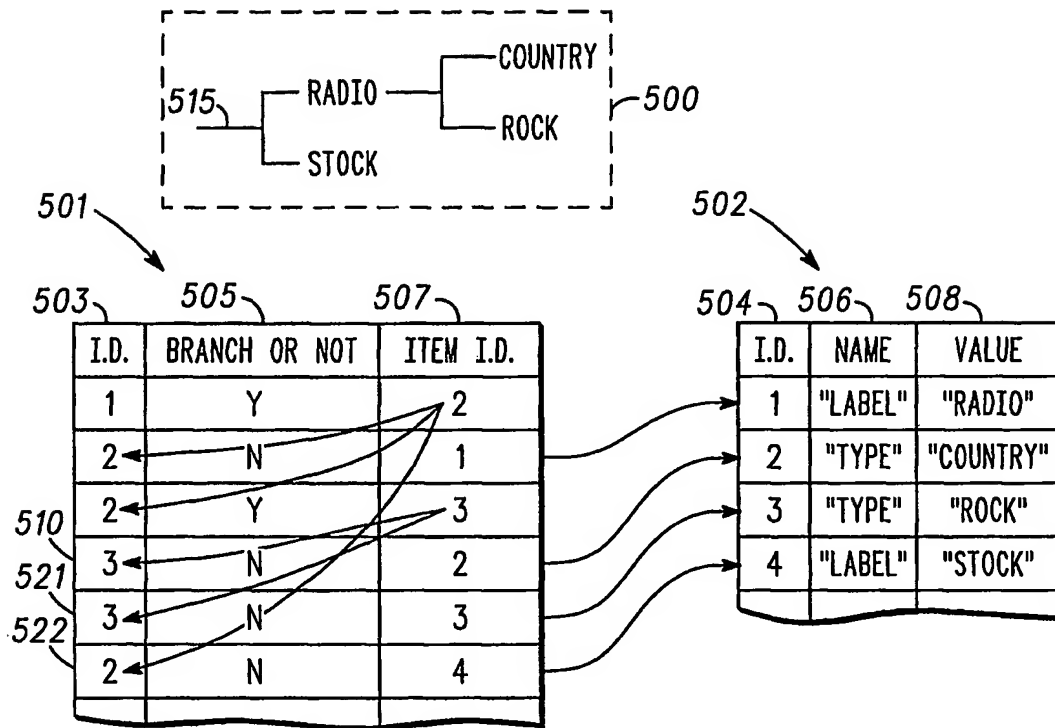


FIG. 9


DECLARATION OF NON-ESTABLISHMENT OF INTERNATIONAL SEARCH REPORT

(PCT Article 17(2)(a), Rules 13ter.1(c) and Rule 39)

Applicant's or agent's file reference TC00037	IMPORTANT DECLARATION	Date of mailing(day/month/year) 01/11/2001
International application No. PCT/US 01/ 25227	International filing date(day/month/year) 10/08/2001	(Earliest) Priority date(day/month/year) 11/08/2000
International Patent Classification (IPC) or both national classification and IPC G06F17/60		
Applicant MOTOROLA, INC., A CORPORATION OF THE STATE OF DELA		

This International Searching Authority hereby declares, according to Article 17(2)(a), that no international search report will be established on the international application for the reasons indicated below

1. ☒ The subject matter of the international application relates to:
- a. ☐ scientific theories.
 - b. ☐ mathematical theories
 - c. ☐ plant varieties.
 - d. ☐ animal varieties.
 - e. ☐ essentially biological processes for the production of plants and animals, other than microbiological processes and the products of such processes.
 - f. ☒ schemes, rules or methods of doing business.
 - g. ☐ schemes, rules or methods of performing purely mental acts.
 - h. ☐ schemes, rules or methods of playing games.
 - i. ☐ methods for treatment of the human body by surgery or therapy.
 - j. ☐ methods for treatment of the animal body by surgery or therapy.
 - k. ☐ diagnostic methods practised on the human or animal body.
 - l. ☐ mere presentations of information.
 - m. ☐ computer programs for which this International Searching Authority is not equipped to search prior art.
2. ☐ The failure of the following parts of the international application to comply with prescribed requirements prevents a meaningful search from being carried out:
- ☐ the description
 - ☐ the claims
 - ☐ the drawings
3. ☐ The failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions prevents a meaningful search from being carried out:
- ☐ the written form has not been furnished or does not comply with the standard.
 - ☐ the computer readable form has not been furnished or does not comply with the standard.
4. Further comments:

Name and mailing address of the International Searching Authority  European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Lucia Van Pinxteren
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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 203

The claims relate to subject matter for which no search is required according to Rule 39 PCT. Given that the claims are formulated in terms of such subject matter or merely specify commonplace features relating to its technological implementation, the search

examiner could not establish any technical problem which might potentially have required an inventive step to overcome. Hence it was not possible to carry out a meaningful search into the state of the art (Art. 17(2)(a)(i) and (ii) PCT; see Guidelines Part B Chapter VIII, 1-6).

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.